~~Rand Corporation~~.

I ~~had just~~ joined Rand permanently in July of 1959, having spent the summer of '58 there as a consultant. In the summer of '59 I chose as a focus of my research the command-control process for nuclear forces. This was a question which was coming to seem of increasing importance as people studied the process of the alerting of nuclear forces in the event of an oncoming nuclear attack and the implementation of an execute order by the President.

~~me go right to the fact that~~ In the fall of '59, I moved to Camp Smith, CINCPAC Headquarters in Hawaii. I did not agree to stay for the whole year since my wife was not willing to accompany me but I did go for several months at first and then went back repeatedly during 1960 to help them in later stages of their report. The basic problem we were to look at was how to assure the reliability of an "execute" message getting out to the various forces in the Pacific if a decision were ever made to use nuclear ~~force~~ weapons. But there were many related questions. We had communications experts with us, of course, who were looking in particular at redundancy and reliability and speed in the communications system. Another problem that I was interested in was the unauthorized action problem: how to assure that no subordinate would be able to launch the forces under his command in the absence of an authorization from the President or from his superiors. A third problem was how to assure the survival of authority at various positions of command so that the whole command structure could not be put out of action by a coordinated surprise nuclear attack. (To this end, for example, a command post in Hawaii was located in an underground command center. It had been originally an ammunition storage depot, built under a pineapple field in Hawaii during the Second World War.)

In the end, in pursuit of this problem, I was in almost every command post and in particular every underground command post in the Pacific and in the U.S.

command post in the U.S. and in the Pacific, of which there are quite a few. For example the command post in Japan itself was in what has formerly been the Japanese Imperial Command Post, which was in the outskirts of a suburb of Tokyo. But all of these underground command posts had been built essentially against conventional bombs and as a result very little attention had been given, in particular, to blast doors. The blast of a nuclear explosion would be so great that if it were anywhere in the vicinity of one of these undergrounds it would blow through any ordinary security door and kill everyone inside. In other words, it is not enough that you have protection from a direct hit over your heads from a small bomb or even from a very large bomb, but every aperture letting in ventilation, letting out communication, and allowing for doors, had to be equally secure against blast pressure or the thing was entirely worthless. These doors were a very important practical problem, not entirely easy to solve. Even when you solved that, if you were to operate from there you had to assure that you would be able to communicate out even after explosions; and a relatively late problem we discovered in the course of testing was that the blast, by shaking up all the electronic equipment inside could easily destroy the functioning of all of your radios, transmitters, etc. even though it did not kill anyone. So we had many these problems with decreasing the vulnerability of both the communications and the commanders themselves.

Remember that from very early on, indeed, by the time of the Atomic Energy Act by Congress, the President alone, in principle, controlled the use of all nuclear weapons and authorized the use of nuclear weapons. This is one tactical military decision which is, by statute and by certain Presidential directives, reflected in the written war plans, limited to the authority of the President alone. The same applies to a few other weapons like bacteriological weapons or gas, in terms of plans.

Meanwhile, it was generally recognized within the Air Force that there was a severe problem of communications and of survival of command. In their extreme focus on being able to carry out their mission of exploding nuclear weapons over Russian targets when appropriate, a great many other problems, such as not exploding them when not appropriate, were deemphasized; particularly in the light of the fact that there was a high likelihood, much greater than presidents were likely to realize, that communications could be disrupted.

You had, in other words, a command structure which presumed that only a president could ~~allow~~ call for the firing of nuclear weapons. At the same time you had an awareness by most of the military people down the chain that the president himself could easily be killed by a bomb on Washington and in fact most intervening levels of command could easily be wiped out by only a few more bombs. They lived with what was for them a nightmare: that in the event of actual attack there was no likelihood that an authorized command would reach the actual operating level of the nuclear delivery forces. ~~In effect~~ As a result there was great resistance on their part to the very idea of procedures that would make it physically impossible for those lower levels to take action on their own in the event of an actual war. At the same time, of course, they knew that they had always to give lip service to the assumption that only the President could "release these weapons." The effect of this was that

they chose not to look closely at the system that really resulted, which left enormous leeway, in fact almost untrammeled opportunity, for individuals to carry out unauthorized action.

I had become possibly the most knowledgable person in the country on the processes of this control system by the time that the ~~books~~ movies Fail-safe, Seven Days in May and Dr. Strangelove appeared. Strangelove is actually based on a book called Red Alert and Fail-safe was by William Burdick. What I had discovered was that the problem in Burdick's "Fail Safe" - ~~was~~ a mechanical, electronic failure by a computer transmitting an improper direction - was actually very unlikely inasmuch as there were many levels of human intervention at various points and the system was not set up mechanically to transmit things like that. But then on the other hand the Red Alert or Strangelove problem - where a base commander took it on himself to launch his planes deliberately - was a very real problem and was in no way physically ruled out. In fact from my work as early as the summer of '58 at Rand I had become aware of the many opportunities and possibilities where even an honest misunderstanding of a situation by a lower commander might lead him to believe that it was his duty to carry out such an attack -- that the moment had arrived. (See my memo on this). This is the sort of thing that I set out to focus on in the Pacific.

Our CINCPAC study group visited, among other places, a USAF base at Kadena, Okinawa, where a dozen or so F-100's were on ten-minute strip alert. The pilots were allowed to leave the strip for errands, while they were on alert duty, because they were each accompanied by a jeep and driver and an alert drill was practiced at least once a day. In fact, to demonstrate their capability the officer in charge offered to let us pick the time to call an alert during our visit, which we did. Klaxons went off everywhere within hearing, jeeps began converging on the strip within minutes and pilots were scrambling into their planes while we watched the clock. Amazingly enough, the engines were gunning and the planes were ready to takeoff in less than ten minutes: a stunning performance.

They did not, however, either taxi to the end of the runway or actually take off in such alerts--as SAC planes frequently did, or as certain other types of tactical fighter bombers did--because, it was explained to us, the 1.1 megaton thermonuclear bombs (each one more than 50 times the explosive power of the Nagasaki weapon) that hung underneath the planes were somewhat obsolescent weapons. They were not "sealed pit" weapons, they were basically designed to be carried inside a plane, not slung underneath, and they were "not 3-point-safe." A 3-point-safe, which was characteristic of the newer weapons,meant that if three sections of the high explosives that surrounded the fission core--which in turn was to set off the thermonuclear material--went off accidentally, the result should not be a

nuclear explosion, but if more than three went off it might explode, have a partial explosion or a total explosion. That meant, in other words, that if these older weapons were dropped, ~~that~~ one or burned, or two sections of the high explosive going off might result in a partial or total nuclear explosion, and this risk, while small, was not worth taking in an alert, which after all happened once a day, a full-scale alert which involved pilots actually jumping into planes and running up their motors. But they did not go to the point of going down the runway, because of the danger of an accident in which one might go off.

I had been concerned at Rand with the false alarm problem. This led in my mind immediately to the question, supposing some day there was not an alert but a false alarm sufficient to cause these planes to execute their emergency plan, short of an execute order. This called for these planes actually to take off and to circle in rendezvous areas until they received an execute order. If they did not receive it, they were eventually to return to base. This was the "fail-safe" concept. The takeoff was simply for their physical protection lest they be caught above ground by a nuclear attack. This might result either from an alerting order from Washington, or more likely from some theater command, concerning danger of some sort, and of course it would result ~~probably~~ if a nuclear weapon went off anywhere in

the theater. There would be sufficient expectation that a nuclear attack was underway as to cause most commanders to tell their subordinate commanders to execute at least protective launch. In theory again, remember, there was to be no "execute" unless they received a positive order to go ahead. This is the essence of what is known as the fail-safe procedure. No plan allowed them, without an execute order, to decide for themselves to go ahead and execute. Only if they received an authenticated message that had certain passwords - characteristics that indicated that it came directly from the President - ~~was it~~ were they to go towards target.

The problem that I discovered was that this was a process that could be set in motion, ~~be~~ for one thing, by a nuclear blast anywhere in the area; but there was the additional problem that once a blast went off anywhere in the area there were several other effects on expectation. For one, knowledge of that very fact would almost certainly convince most people that a nuclear attack was underway, subjectively, whether or not they had received an execute order. Second, if they were launched for any reason at all - such as a blast in some other theater, like the European theater, or intelligence warning - a subsequent blast then had a distinctly higher likelihood than earlier, by the very fact that these planes were now taxiing and taking off. It was in recognition of that danger that

they were forbidden to take off under normal alerting or practice procedures. So that meant that if you had a blast anywhere in the world or had other reason to expect an attack, a nuclear weapon had some significant likelihood of going off accidentally in the next few minutes somewhere in the world on an alert strip.

A third result was that that fast-alert blast in itself would almost certainly disrupt all communications within the area. Certainly it would destroy all transmitting points in the vicinity of the base, but moreover, the electronic affects of the blast itself would probably disrupt all high frequency communications in that area. That meant that the last message that any other bases in the area would receive, for a period, would be that a blast had just occurred and they would then find themselves out of communications locally; just after, perhaps, a message putting them on an extraordinary [illegible] of alert, requiring them for the first time actually to take off. Fourth, the very fact that they had gotten to the point of actually launching would be a first for any of those pilots and would itself subjectively make them almost certain that an attack was underway.

All of this added up to the likelihood that a high level false alarm anywhere in the world was considerably likely to generate the belief in the minds of some airborne pilots armed with megaton weapons that, although they had not received an execute order, general nuclear war had already

So the fact was, in other words, that the secrecy system was being used - for reasons almost entirely of agency pride - to protect a totally irrational arrangement which had the most horrendous possible diplomatic implications, and it was out of the effective control of the President of the United States, let alone the Congress.

Exposing this to Congress would have immediately raised the secrecy question, even to someone on the Hill with a clearance who dealt with such matters. It would have been treated as the exposure of an extremely "sensitive" secret. And it was. Remember, what is a "sensitive secret?" It ~~was~~ is a secret like My Lai. It is hard to say that My Lai was not a genuine secret, in the sense that exposure of it had the potential of "damage to the United States." The exposure of any egregious violation does.

In summary, we see a function of Rand here, in the ability of Rand analysts and consultants to cross bureaucratic lines, to become aware of information concealed by one agency from another, or by all agencies from higher levels of authority, who were authorized to know it but had been deliberately deceived about this information. We have the incident of information stamped and intended only for one recipient within the system, the Assistant Secretary of Defense, immediately being leaked internally; the copying of that document and delivering it to the CNO entirely

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77 missing?

against DoD Regulations; in other words, the regulations are violated instantly and blatantly when that serves Service interests (of protecting a practice violating a U.S. treaty!) We have the deliberate and direct deception of the Secretary of Defense and his Special Assistant, and the defiance of the Secretary by a lower agency of his directive to change the situation, about which he had been deceived and about which he had been kept in ignorance by the protective secrecy system. We have also the inhibitions of everyone in the system not only to go against bureaucratic resistances but to do so in violation of secrecy regulations which would have made it difficult to go to Congress let alone to the press. Also we have the fact that what was a genuinely "sensitive" secret was so precisely because it involved a major violation of an international treaty by the United States. Indeed, if you ask what sorts of information could conform to the definition of "top secret" as potentially leading to a direct breach in diplomatic relationships, obviously it would cover to a large extent major violations of our understandings or treaties with other countries. And the capability to keep such sensitive secrets is an encouragement to violate Congressionally-ratified treaties, without any accountability to Congress or the public.

nuclear delivery system were aware of the central problem of reliability, by 1960 and 1961, which had to do with communications and with the vulnerability of command posts and commanders. The prime principle in the control of nuclear weapons, one that was written into the Atomic Energy Act itself, was that the use of nuclear weapons had to be controlled and authorized by the President personally. All written plans expressed that principle. The military, however, were very conscious that this posed the possibility that the President and virtually all of his legal successors could be destroyed by a single nuclear weapon on Washington, so that the system would be deprived of its control authority; if the strict letter of the law were followed, the entire system would be paralyzed. Even in a physical sense, the destruction of a number of communications terminals such as the central command facilities both in Washington and in SAC Headquarters in Omaha and a handful of others in the country, would make it close to impossible to get the word out to all world-wide nuclear forces, or even to forces within the country, either for an alert or to execute the general war plans. It gradually came to be recognized that this was a separate and almost more urgent problem than the vulnerability of the bases themselves.

In the '50's Rand, through the work of Albert E Henry Rowen, Wohlstetter, Fred Hoffman, and Andrew Marshall, in their reports R-266 and R-290, which are now unclassified, the

Air Force and the President had become aware of the vulnerability of the bases and the vehicles themselves, since the bombers were clustered on a relatively small number of bases which were highly vulnerable. This was a major concern of the Gaither Report in 1957, which was in large part based on briefings by analysts from Rand. It was not until 1959 and 1960, as that problem came under control in part with the onset of Polaris forces and Minuteman, that it became realized that even if the vehicles survived worldwide, the system could be paralyzed by attacks on the communications centers and the commanders, which were small in number and also vulnerable. In principle, being smaller in number, these could be made less vulnerable, made hardened or mobile in various ways. But on the other hand, it was very difficult to harden a small number of points adequately against a determined attack. This was the problem on which I specialized--the reliability, in various senses, of the command process. I picked this problem partly because it had just been recognized as urgent about the time I came to Rand, and partly because I was drawn to it intellectually from my long interest in the decision-making process under uncertainty.

In fact, I was asked to Rand partly because of my work in decision theory. When I arrived I read the then Top Secret Report R-290, mainly by Albert Wohlstetter. At one point in that report, which was written in 1956,

there is an analysis of the following problem. The vulnerability of the retaliatory bomber force depended on how quickly it took to the air after an alert. But that in turn depended on how quickly an order to take off was given after the initial signals had appeared. This was a period that had to be measured in minutes, since if ballistic missles were on their way the earliest possible warning would be 15 to 20 minutes. The question became, How soon after the earliest radar warning would an order go out to the planes, and then, once having gotten the order, how quickly could the force get into the air?

Wohlstetter pointed out that the planning and the calculations of this problem were based on the assumption that either the situation was peace-time, in which case there were no signals, or else that the president was told that there was an attack underway, in which case one could ask, physically, how fast would he react to that information? But Wohlstetter pointed out that in the early minutes of an actual attack, by far the most likely situation was that he would not know for certain whether he was under attack or not, since the signals would be partial and equivocal; you really had to look at his decision time in terms of that uncertainty situation.

Well, this sort of hypothetical problem was immediately fascinating to me, because it was essentially the subject of my honors thesis at Harvard and later, in

more general form, the subject of my Ph.D. thesis. In fact, the very summer before, in 1957, at Stanford, I had been on a Social Science Research Council grant in a group studying decision making under uncertainty, at the end of that summer (just a month before the Soviet ICBM test, and the Gaither Report). So my immediate reaction in the summer of 1958 was that I had found an area where practical problems of the greatest importance were being formulated in terms that lent themselves immediately to the abstract analysis that I specialized in. Since that abstract analysis had to do with individual decision-making under uncertainty, it lent itself directly to problems that focused on decision-making by an individual such as the President. In those days, many abstract analyses personified an entire nation or strategic system such as Russia or the U.S. as a single "player" or strategist; that type of analysis was obviously at best an extreme simplification, an abstract aid to thought. I was particularly drawn to practical problems where one realistically was concerned with decisions by a single individual; the decisions by the President of the United States in his control of nuclear weapons, which by law were given exclusively to one individual, were a perfect area for me. I had been thinking about such problems for a number of years. So I gradually made myself very expert in the concrete circumstances of these Presidential problems. But that in turn required me to be dealing

I had visited RAND for the first time, leading to an invitation later to spend the Summer of 1958 there as a consultant

with what were regarded as the highest and most sensitive secrets. First, they were within the nuclear strategic area; second, they concerned ~~the concerned~~ nuclear war planning; third, they concerned control in actual nuclear war; and fourth, control by the President at the highest level. So, by every step, I was led to what we thought of as our most sensitive command and control information.

Now, in the course of my work in the Pacific, I was concerned not only with the assurance that we would launch our weapons, but with the risk that we would launch them on some occasion inappropriately, by a false alarm or unauthorized action, and bring about a war in that fashion. I became aware of a widespread attitude that there did, in fact, exist an agreement between the President and unified commanders that in the event of communications failure - which was fairly likely, it happened all the time in those days and perhaps still does - that a unified commander did have the right to launch or even "execute" his vehicles if he had reason to believe that a nuclear attack was imminent. The Reorganization Act of 1958 specifies a number of "unified or specified commanders." "Unified commander" means a theater-type commander controlling a number of elements from different services, such as CINCPAC in the Pacific, CINCAL in Alaska, CINCEUR in Europe (who is also SACEUR for NATO forces, i.e., Supreme Allied Commander in Europe). SAC is the only "specified" command, a command at that level which has

only elements of one service. There were nine of these all together, as I remember. Everyone was clear on the supposed fact that only the unified or specified commanders had the alleged authority. This was a belief, in the Pacific, that clearly contradicted the principle that everyone seemed to believe in Washington, that only the President could launch or execute nuclear weapons, and that nothing had been delegated. No one could point to any basis for this in writing, and I came to believe ~~that~~ it probably this was a rumor, a myth, that such authorization had been given. If so, in its generality and impact it was like one that I had encountered when I was a platoon leader in the Marine Corps; there was a belief held by all enlisted men, but known to no officers, that a Bad Conduct Discharge could be reversed by evidence of good behavior after a year or two when one was out of the service, and that therefore a BCD had no real effect on one's later employment opportunities or anything else. This belief proved to be totally false, yet its existence, not known to the officers, when I investigated it, meant that the deterrent effect of a threatened BCD was almost nullified. In the case of this belief in the Pacific Command, I likewise found that the psychological effects of the belief were extremely widespread, because it was applied at each level of command by analogy to themselves. Since they were all "aware" that the unified commander had this alleged authorization from the President, they believed that in

logical terms it should also apply to them, if they were out of touch with their next higher level of command. This was discussed quite frankly by a number of people at different levels in the following terms: "Yes, of course, it's against the book, but..... if this were the situation...."

So I came back to Washington with the feeling that if the belief were untrue, it was of the highest urgency to counteract that belief. And if it were true, on the other hand, then special methods were essential to counteract the effects of it at lower levels. In fact, I was prepared to say that they should consider changing the authorization, if it existed, if for no other reason than to change the imitation of it at lower levels, because that widespread belief seemed absolutely fatal. It communicated itself down to every pilot in the world. This was one of the reason things, by the way, that made me feel the great urgency of getting a physical lock onto all of these weapons.

This was one of the things that I briefed to McGeorge Bundy, ~~finally~~, in that long briefing in February 1961. The result ~~of that~~ was that Bundy and Harry Rowen agreed that this was of great importance to investigate. Bundy at that time did not know and was not able to find out whether there was such an agreement. He could see nothing in the files that indicated what I described, but

since it is the practice of departing Presidents to take most of their files with them, that look was not conclusive.

(Parenthetically, ~~there~~ let me mention something I observed when I happened to be in Washington on a trip in December of 1962, just after the Cuban missile crisis, while Kennedy was with MacMillan in Nassau discussing the termination of the Skybolt contract. Skybolt was an air-launched missile that we had agreed to furnish the British for use by their bombers; Kennedy had just decided not to complete development of it. I dropped in on Adam Yarmolinsky in McNamara's office and found him doing a lot of telephone calls. He had been called the night before from Nassau by Kennedy for a copy of the Skybolt Agreement which had been made between Eisenhower and MacMillan. MacMillan was claiming that our cancellation of Skybolt was a direct contradiction of assurances by Eisenhower that if we were to drop the contract we would provide money to the British for them to continue their own Skybolt research. This was not Kennedy's belief so he wanted to see the exact copy of the agreement. It was discovered that only an aide-memoir had been done on the basis of Eisenhower's conversation with MacMillan, which had taken place with the two of them alone. No one else had been present during that conversation, but a subsequent memo had been written. No copy of it could be found. The staff searched the White House files and they searched the DoD

files and the OST files and no one could find a copy of any such agreement between the two heads of state. Finally it was concluded that Eisenhower had taken it with him to the Eisenhower Library, but the person who had called John Eisenhower, who was then in charge of the Eisenhower Library, was on bad terms with him, and Eisenhower had curtly refused to go to the trouble of searching the file at that moment to discover the Agreement while Kennedy was discussing the matter with McMillan. So Yarmolinsky was phoning around urgently, trying to get over this little human blockage so that we could get a copy, which they finally did get from the Eisenhower Library.)

At an NSC meeting, McGeorge Bundy announced that a Joint White House/DoD Committee of one - namely, Daniel Ellsberg - was being formed to investigate the problem of presidential authorization of the use of nuclear weapons. I then was authorized